

REMARKS/ARGUMENTS

General:

Claims 1-23 are pending in the application. Claims 1-23 are rejected.

The Cross-Reference to Related Applications has been updated to show the serial numbers of the co-pending applications, which were not available when this application was filed. No new matter has been added by this amendment.

Claim Rejections - 35 USC § 103

Claims 1-5 and 7-8 (of which claims 1 and 8 are independent) are rejected as obvious over U.S. Patent No. 6,167,077 (Ducaroir) in view of Kobayashi.

Dependent claim 6 is rejected as obvious over Ducaroir in view of Kobayashi, and further in view of U.S. Patent Application No. 20040071250 (Bunton).

Claims 9-12 and 17-23 (of which claims 9, 17, and 22 are independent) are rejected as obvious over U.S. Patent No. 6,992,987 (Kobayashi) in view of U.S. Patent Application No. 2002/0133762 (Susnow).

Dependent claims 13-16 are rejected as obvious over Kobayashi in view of Susnow, and further in view of Bunton.

The rejections are traversed. None of the cited references describes a link training system in which failed links are identified by comparing the link management data at the deserializers, or in which corrective action is taken at the deserializers, as recited in the claims. Of the four cited references, two (Kobayashi and Ducaroir) describe training systems that assume training is always successful, and a third (Susnow) merely stalls the link until the link is restored. Only

Bunton even considers the possibility of a truly failed link, but Bunton offers no remedy except to power down the failed port and search for a physical fault.

Regarding claims **9, 17, and 22**, Kobayashi describes a system for transmitting video data to a monitor using a high-capacity main link 222 and a low-capacity auxiliary link 224. The auxiliary link 224 is used for messages from the receiving device to the transmitting device. In a training process at link setup time, known packets are sent over the main link, and the transmission speed is progressively reduced until reliable transmission is achieved, as reported back on the auxiliary link, see col. 12, lines 31-44.

Susnow describes a system for monitoring the rate of “minor link physical errors” in operation of a link, and initiating retraining if the error rate exceeds a certain threshold, see paragraphs [0007] and [0024]-[0025]. A variety of possible errors are listed in paragraph [0005]. The only “training” described is to transmit a test pattern and determine whether it is correctly received, see paragraph [0006].

As a preliminary matter, the Office reads together col. 12, lines 30-45, col. 14, lines 22-26, and col. 18, lines 29-5 of Kobayashi. However, the first and third of those passages relate to the main link, and the second relates to the auxiliary link. There is no showing, and given the different natures and functions of the main and auxiliary links it cannot be assumed, that the main and auxiliary links are similar. In particular, the auxiliary link is never subject to any training or monitoring, but is assumed to function correctly. Kobayashi thus does not show a system having the combined features of those three paragraphs as the Office combines them.

Regarding **claim 9**, the Office cites Kobayashi as showing “a system that can handle failed links during training,” but that is not correct. Kobayashi does not have “failed” links, only

faster and slower links. Col. 18, line 43 refers to a “pass/fail bit” but at line 47 it is seen that the “fail” is not really a fail, but only a “fail at this speed, try the next speed slower.”

The Office cites Susnow as showing “sending instruction to transmitter and receiver to handle link failure” but the cited paragraph 6 of Susnow describes a “retraining” process that continues “until they both agree and arrive that the link is in a good state.” Susnow’s system cannot handle an actual failure; it merely marks time and prevents the link from being used until some transient disruption clears itself. Further, there is no teaching of any “instruction to transmitter and receiver” in this context. The Office apparently infers that there must be some communication from the state machine in paragraph [0025] to the nodes in paragraph [0005], but Susnow provides no information on the subject.

Thus, Kobayashi and Susnow, separately or together, do not disclose or fairly suggest “an instruction set providing link training instructions to the serializer and to the deserializer to handle links that fail training,” as required by claim 9. Claim 9 is therefore believed not to be obvious over the cited references.

Regarding **claims 17 and 22**, the Office cites col. 10, lines 20-30 of Kobayashi as showing “comparing how the link management data is being processed by the deserializers,” but that is not correct. As the Office acknowledges at page 4, line 18 of the Office action, the cited passage describes only a process by which the receiver sends *something* back to the source. Given the low capacity of the auxiliary link used for that purpose, there is no suggestion that a copy of the received data would be sent back for comparison purposes. In any case, claims 17 and 22 recite a comparison among a plurality of deserializers, not a comparison between a single deserializer and its source. (This feature is described in more detail by way of example in paragraph [0072] of the present specification.)

Thus, Kobayashi and Susnow, separately or together, do not disclose or fairly suggest the comparison among a plurality of deserializers required by claims 17 and 22. Claims 17 and 22 are therefore believed not to be obvious over the cited references.

Claims 10-12, 18-21, and 23 are variously dependent from claims 9, 17, and 22 and, without prejudice to their individual merits, are deemed to be non-obvious over Kobayashi and Susnow for at least the same reasons as their respective base claims.

In addition, with reference to claim 11, it is respectfully pointed out that for the link training in either Kobayashi's system or Susnow's system to be useful, the obvious approach is to use signals similar to the actual data signals. Therefore if, as the Office concedes, Kobayashi does not use a SERDES for training, that is because Kobayashi is not using SERDES signals on the main link in actual operation (The passage in col. 12 to which the Office cites relates specifically to the auxiliary link.), and it would therefore not be logical to use Susnow's SERDES system for training of Kobayashi's main link.

Regarding claim 18, Kobayashi does not teach formatting the link management data "to ensure uniform processing by the deserializers." Kobayashi does not even have plural deserializers receiving and processing the link management data. The passage cited by the Office, which is primarily a list of hardware, does not appear relevant.

Regarding claim 19, the cited passage at col. 15, line 66 to col. 16, line 5 of Kobayashi does not describe reprogramming the serializers and deserializers. At most, it describes reinitializing the single main link using the same programming used previously. As is explained by way of example in paragraph [0072] of the present specification, in a link with plural serializers and deserializers (which Kobayashi does not have) reprogramming allows the link to retrain to work round a defective link channel.

Regarding claim 21, the Office cites Kobayashi as teaching “retraining the failed link.” Claim 21 in fact recites “retraining the failed links.” As has already been explained, there is a difference between retraining a single link and retraining a plurality of co-operating links. There is no suggestion in Kobayashi of retraining plural links.

For these reasons also, at least claims 11, 18, 19, and 21 are believed to be non-obvious over Kobayashi and Susnow.

Dependent claims 13-16 are rejected as obvious over Kobayashi in view of Susnow, and further in view of Bunton. Claims 13-16 are dependent from claim 9, and Bunton is relied on only for the additional features of the dependent claims. Without prejudice to their individual merits, therefore, claims 13-16 are deemed non-obvious over the three references for at least the same reasons as claim 9 is non-obvious over Kobayashi and Susnow alone.

In addition, regarding claim 13, the Office asserts that Bunton at paragraphs [0050]-[0051] “teaches data being sent serially to only trained link, with failed link being deactivated” but no such teaching is found in the reference. Bunton does consider the possibility of a link being deactivated because of a physical link fault, but there is no mention of parallel links to which data can be re-routed. In any case, that is not what claim 13 says. Claim 13 recites the *link management data* used during the training protocol being received by a selected number of deserializers, not the service data sent after training. There is no suggestion in the cited references of the feature recited in claim 13.

Regarding claim 14, there is no suggestion in Bunton of a comparison to identify which receivers have processed link management data properly and which have not, as recited in claim 14. The cited passage from Bunton describes only the training or failure of a single link.

Regarding claim 15, the Office does not even allege that Bunton teaches reprogramming the links, and the remarks above regarding claim 19 apply to claim 15 also.

The remarks above regarding claim 21 apply to claim 16 also.

For these reasons also, at least claims 13-16 are believed to be non-obvious over Kobayashi, Susnow, and Bunton.

Regarding **claims 1 and 8**, Ducaroir is cited as teaching a method of handling failed link training, but no such teaching is found in the reference. The cited passages of Ducaroir describe a system for deskewing, in which it is assumed that all links are working properly, and that a valid “preskew” pattern can be generated. Kobayashi does not provide the missing teaching because Kobayashi also, as discussed above, does not teach handling failed link training. The cited passage from Kobayashi describes only a process of progressively decreasing the link speed until a satisfactory transmission is obtained, and it is assumed that the process will always succeed. Thus, the cited references, however they are combined, do not teach or fairly suggest observing a link failure, and *a fortiori* do not teach or suggest processing by the deserializer upon observing a failure to identify a corrective action, as recited in claims 1 and 8. Since the cited references do not teach or suggest all the features recited in the claims, the claimed system and medium are not obvious over the references, and the rejection of claims 1 and 8 under § 103 should be withdrawn.

Claims 2-5 and 7 are dependent from claim 1 and, without prejudice to their individual merits, are deemed to be non-obvious over Ducaroir and Kobayashi for at least the same reasons as claim 1. In addition, regarding claim 2, Ducaroir does not teach reprogramming the serializer and the deserializer. Ducaroir teaches only reprogramming the serializer **or** the deserializer. To

reprogram only one end is the correct approach for deskewing, as described in Ducaroir, but is inapplicable for training around a link failure as recited in claim 2.

Regarding claim 7, Kobayashi is cited as teaching “communicating the link management data between the serializer and deserializer upon a link training [failure] event.” However, the communications relied on by the Office are on the auxiliary link. As explained above in respect of claims 17 and 22, there is no indication that the communications sent in the event of a detected failure would comprise the link management data which (see claim 1) are the data transmitted over the link being trained. The only data that Kobayashi needs to transmit in the cited passages is a simple signal indicating that an acceptable signal is or is not being received.

For these reasons also, at least claims 2 and 7 are deemed to be non-obvious over the cited references.

Dependent claim 6 is rejected as obvious over Ducaroir in view of Kobayashi and further in view of Bunton. Claim 6 is dependent from claim 1, and Bunton is relied on only for the additional features of the dependent claim. Without prejudice to its individual merits, therefore, claim 6 is deemed non-obvious over the three references for at least the same reasons as claim 1 is non-obvious over Ducaroir and Kobayashi alone. In addition, as explained above with reference to claim 14, there is no suggestion in Bunton of a comparison across a plurality of deserializers, as recited in claim 6. The cited passage from Bunton describes only the training or failure of a single link. For these reasons also, claim 6 is deemed to be non-obvious over the cited references.

Based on the arguments presented above, withdrawal of the 35 USC § 103 rejection of claims 1-23 is respectfully requested.

Conclusion

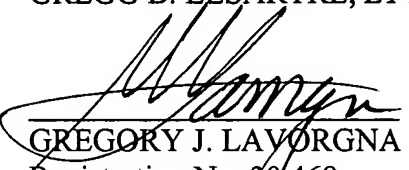
In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claims 1-23, is in condition for allowance and a notice of allowance is respectfully requested.

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

Respectfully submitted,

GREGG B. LESARTRE, *ET AL.*

BY:


GREGORY J. LAVORGNA
Registration No. 30,469
Tel: (215) 9880-3309
Fax: (215) 988-2757
Attorney for Applicant